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10/613,531	07/02/2003	Wayne D. Grover	LAMA121377	4541

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EXAMINER	
AHMED, SALMAN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/613,531	GROVER ET AL.
	Examiner	Art Unit
	SALMAN AHMED	2419

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-13* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claims 1-13 are pending.

Claims 1-4 and 6-13 are rejected.

Claim 5 is objected to.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-4, 6-10 and 12-13 are rejected under 35 U.S.C. 102(a) as being anticipated by Grover (US6421349).

Regarding claim 1, Grover discloses a method of providing a mesh telecommunications network with spare capacity arranged in pre-configured cycles, where the mesh telecommunications network includes multiple cycles that may be potentially configured to provide restoration paths (column 11 lines 1-5, 10-14 and abstract, the algorithm is distributed in the sense that its execution is spread amongst the significant processing power present in the DCS machines which form a mesh network's nodes. This DCPC algorithm is based on the self-healing network (SHN) protocol described in U.S. Pat. No. 4,956,835 issued Sep. 11, 1990. Both the SHN protocol and the DCPC method implement a distributed algorithm which generates efficient path sets for span restoration and both use statelet based processing. A

Method for restoring traffic in a network. The network includes plural distinct nodes interconnected by plural distinct spans, each span having working links and spare links. Each node has a digital cross-connect switch for making and breaking connections between adjacent spans forming span pairs at a node. Cross-connections between spare links in adjacent spans are made such that sets of successive nodes through which the adjacent spans form span paths form closed paths), • pre-selecting a set of candidate cycles for forming into pre-configured cycles set of candidate cycles comprising a ranked sub-set of the multiple cycles (see col. 6 lines 54-59 a preconfigured crossconnection is a crossconnection at a node which is preset between spare links in statistical anticipation of a span failure. A PC plan is the network wide state of all preconfigured crossconnections and the spare links which then interconnect and col. 3 lines 14-39; candidate cycles is not further specified therefore it is broadly interpreted. In column 4 lines 1-10 and 49-51, Grover teaches in a further aspect of the invention, a closed path is formed by making cross-connections between successive spans in one of several routes followed by incoming statelets received by an originating node, which one of several routes may be selected according to an ordering of fields in the incoming statelets. The ordering may be based upon a relationship between the number of paths available for restoration of telecommunications traffic along the successive nodes by which each incoming statelet has been broadcast and the number of spans traversed by the respective incoming statelets (i.e., a ranked sub-set of the multiple cycles). In a further aspect of the invention, the selected one of the distinct routes is selected according to an ordering of the distinct routes (i.e., a ranked sub-set

of the multiple cycles. Grover hows, FIGS. 16A-16F show examples of patterns which result in a sample network using the DCPC with closed path order in descending node total working links with sparing patterns generated by IP2-closed path (defined below); FIGS. 17A-17E are examples of patterns which result in a sample network using the DCPC with closed path order in increasing node total working links with the sparing plane. generated by IP2-closed path. Grover teaches in column 21, lines 5-22 and 42-54, Globally, the DCPC protocol executes in the following manner. Each node in the network takes a turn at being the originating node in an order which is predetermined and is stored locally within the nodes. As each node assumes the role of the originating node, it iteratively generates closed paths, using the rules outlined in the previous section, until it can either no longer generate a closed path or the closed paths that it can generate all receive a zero score. At this point the current originating node gives up the role and signals the next node in the series to become the originating node. The new originating node generates as many closed paths as it can until it too is no longer able to generate useful closed paths. The preconfigured closed paths generated by each node alter the network's configuration as it is seen by later originating nodes. The role of the originating node is successively assumed by all the network nodes and when the last node has terminated its role as the originating node, preconfigured closed path generation stops. A node order with which this algorithm may be used is determined by the total number of working links falling on each network node. Each network node has a total generated of the number of working links contained in the spans which fall on it. The order in which the nodes assumed the role of the originating node is generated by

sorting the nodes in descending order of the calculated working links total. The reverse order is also run to evaluate any performance difference between the two orders. The node's working link total is used to determine the originating node ordering since it seems reasonable that if a node terminates a large number of working links then it should receive an early opportunity to form a part of the PC closed paths generated); • allocating working paths and spare capacity in the mesh telecommunications network based on the set of candidate cycles (see col. 6 line 53 - col. 7 line 26 and abstract the restorability when using a KSP algorithm to calculate a restoration pathset for each of the networks failed spans with the given numbers of spare links and col. 4 lines 25-44); and • providing the mesh telecommunications network with spare capacity arranged in pre-configured cycles according to the allocation determined in the preceding step (see col. 7 lines 6-25 and col. 7 lines 50-65, a Method for restoring traffic in a network. The network includes plural distinct nodes interconnected by plural distinct spans, each span having working links and spare links. Each node has a digital cross-connect switch for making and breaking connections between adjacent spans forming span pairs at a node. Cross-connections between spare links in adjacent spans are made such that sets of successive nodes through which the adjacent spans form span paths form closed paths).

Regarding claim 2, Grover teaches the allocation of working paths and spare capacity is jointly optimized (see col. 7 lines 18-26).

Regarding claim 3, Grover teaches pre-selecting candidate cycles includes ranking a set of closed paths in the mesh telecommunications network according to the

degree to which each closed path protects spans on and off the closed path, and selecting candidate cycles from the set of closed paths (see col. 13 lines 22-42).

Regarding claim 4, Grover teaches ranking of closed paths takes into account the cost of the closed path (see col. 9 lines 35).

Regarding claim 6, Grover teaches allocation of spare capacity is carried out using an integer linear programming (ILP) formulation, where an objective function minimizes the total cost of spare capacity (see col. 8 lines 9-14).

Regarding claim 7, Grover teaches the objective function is subject to the constraints: A. All lightpath requirements are routed (see col. 8 lines 27 - col. 9 line 40); B. Enough channels are provided to accommodate the routing of lightpaths in A (see col. 9 lines 13). C. The selected set of pre-configured cycles give 100% span protection (see col. 9 lines 14). D. Enough spare channels are provided to create the pre-configured cycles needed in C (see col. 9 lines 10-16). E. The pre-configured cycles decision variables and capacity are integers (see col. 9 lines 47-52).

Regarding claim 8, Grover teaches allocation of spare capacity is carried out using an integer linear programming (ILP) formulation (see col. 8 lines 9-14), where the objective function minimizes (see col. 8 lines 23) the total cost (see col. 9 lines 35) of spare capacity and working capacity (see col. 8 lines 13 - col. 9 line 40).

Regarding claim 9, Grover teaches disclose all the limitations as discussed in the rejection of claim 7 and is therefore claims 9 is rejected using the same rationales.

Regarding claim 10, Grover teaches a mixed selection strategy is used for pre-selecting candidate cycles (see col. 8 lines 9 - col. 9 line 60).

Regarding claim 12, Grover teaches the mixed selection strategy includes selecting candidate cycles based on absolute number of straddling spans protected by the candidate cycles (see col. 4 lines 1-11).

Regarding claim 13, Grover teaches telecommunications network designed (see col. 2 line 62).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grover in view of Suet al. (US2002/0163682).

Regarding claim 11, Grover disclose all the subject matter of the claimed invention with the exception of the mixed selection strategy includes selecting candidate cycles randomly.

Suet al. from the same or similar fields of endeavor teaches the use of randomly select path (see Suet al. paragraph 39).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the randomly select path as taught by Su et al. in distributed pre-configuration of spare capacity in closed paths for network restoration of Grover in order to provide ability to create a resource-efficient backup path (see Suet al. paragraph9). Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Allowable Subject Matter

4. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

1. Applicant's arguments see pages 5-8 of the Remarks section, filed 9/12/2008, with respect to the rejections of the claims have been fully considered and are not persuasive.

Applicant argues (see page 6) that it is possible that the Examiner's confusion arises from the use of the term "pre-configured" in relation to cycles; in Grover, the term

"pre-configured" is used with respect to a pre-configuration in advance of a span failure (as opposed to configuration of a restoration path after a span failure) but it says nothing about the temporal relationship of the distribution of spare capacity for span restoration in relation to allocating spare capacity and working capacity in the network. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "the temporal relationship of the distribution of spare capacity for span restoration in relation to allocating spare capacity and working capacity in the network") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues (see page 6) that there is nothing in Grover that discloses or suggests ranking a sub-set of potential cycles.

However, Examiner respectfully disagrees with the Applicant's assertion. Grover does indeed teach the cited limitations. Speecifically, Grover teaches (see col. 6 lines 54-59) a preconfigured crossconnection is a crossconnection at a node which is preset between spare links in statistical anticipation of a span failure. A PC plan is the network wide state of all preconfigured crossconnections and the spare links which then interconnect and col. 3 lines 14-39; candidate cycles is not further specified therefore it is broadly interpreted. In column 4 lines 1-10 and 49-51, Grover teaches in a further aspect of the invention, a closed path is formed by making cross-connections between successive spans in one of several routes followed by incoming statelets received by an

originating node, which one of several routes may be selected according to an ordering of fields in the incoming statelets. The ordering may be based upon a relationship between the number of paths available for restoration of telecommunications traffic along the successive nodes by which each incoming statelet has been broadcast and the number of spans traversed by the respective incoming statelets (i.e., a ranked sub-set of the multiple cycles). In a further aspect of the invention, the selected one of the distinct routes is selected according to an ordering of the distinct routes (i.e., a ranked sub-set of the multiple cycles. Grover hows, FIGS. 16A-16F show examples of patterns which result in a sample network using the DCPC with closed path order in descending node total working links with sparing patterns generated by IP2-closed path (defined below); FIGS. 17A-17E are examples of patterns which result in a sample network using the DCPC with closed path order in increasing node total working links with the sparing plane. generated by IP2-closed path. Grover teaches in column 21, lines 5-22 and 42-54, Globally, the DCPC protocol executes in the following manner. Each node in the network takes a turn at being the originating node in an order which is predetermined and is stored locally within the nodes. As each node assumes the role of the originating node, it iteratively generates closed paths, using the rules outlined in the previous section, until it can either no longer generate a closed path or the closed paths that it can generate all receive a zero score. At this point the current originating node gives up the role and signals the next node in the series to become the originating node. The new originating node generates as many closed paths as it can until it too is no longer able to generate useful closed paths. The preconfigured closed paths generated

by each node alter the network's configuration as it is seen by later originating nodes. The role of the originating node is successively assumed by all the network nodes and when the last node has terminated its role as the originating node, preconfigured closed path generation stops. A node order with which this algorithm may be used is determined by the total number of working links falling on each network node. Each network node has a total generated of the number of working links contained in the spans which fall on it. The order in which the nodes assumed the role of the originating node is generated by sorting the nodes in descending order of the calculated working links total. The reverse order is also run to evaluate any performance difference between the two orders. The node's working link total is used to determine the originating node ordering since it seems reasonable that if a node terminates a large number of working links then it should receive an early opportunity to form a part of the PC closed paths generated.

Applicant argues (see page 6) there is no "allocating working paths and spare capacity in the mesh telecommunications network based on the set of candidate cycles," as claimed in Claim 1.

However, Examiner respectfully disagrees with the Applicant's assertion. Grover does indeed teach the cited limitations. Specifically, Grover teaches allocating working paths and spare capacity in the mesh telecommunications network based on the set of candidate cycles (see col. 6 line 53 - col. 7 line 26 the restorability when using a KSP algorithm to calculate a restoration pathset for each of the networks failed spans with the given numbers of spare links and col. 4 lines 25-44). Grover further teaches (see

abstract, a Method for restoring traffic in a network. The network includes plural distinct nodes interconnected by plural distinct spans, each span having working links and spare links. Each node has a digital cross-connect switch for making and breaking connections between adjacent spans forming span pairs at a node. Cross-connections between spare links in adjacent spans are made such that sets of successive nodes through which the adjacent spans form span paths form closed paths. Examiner further adds that, the claim language is broad and in view of the broadest reasonable interpretation of the claim language, Grover does indeed teach the cited limitations (see above). It is for the same reasons Examiner respectfully disagrees with the Applicant's assertion that in Grover, there is neither pre-selection of candidate cycles, nor allocation of working capacity and spare capacity to those cycles, nor does Grover teach or suggest such an approach.

Specifically, in Applicant's own statement (see page 7), Grover teaches a distributed algorithm (DCPC) is also disclosed for finding a set of pre-configured cycles (i.e. pre-selection of candidate cycles)...Rather, in DCPC, a statelet traverses a network from node to node, acquiring, as it goes, information on the network (e.g., Col. 12, lines 35-55), until it reaches the node (originating node) it started from (Col. 13, lines 22-32), i.e. pre-selection of candidate cycles, whereupon the information gained by the statelet as it traverses the network, and other statelets arriving at the originating node, is used to establish a restoration path or pre-configured cycle (Col. 13, lines 32-42), (i.e. allocation of working capacity and spare capacity to those cycles). The DCPC algorithm thus takes a given set of working links and spare links and finds pre-configured cycles

within those existing links (i.e. pre-selection of candidate cycles, allocation of working capacity and spare capacity to those cycles). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “The design is a heuristic and is not optimum”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/

Examiner, Art Unit 2419